

1982

## **Risk Management Theory: Reducing Liability in Corporate and Medical Environments**

Edward P. Richards

*Louisiana State University Law Center, richards@law.lsu.edu*

Abraham Silvers

Follow this and additional works at: [https://digitalcommons.law.lsu.edu/faculty\\_scholarship](https://digitalcommons.law.lsu.edu/faculty_scholarship)



Part of the [Law Commons](#)

---

### **Recommended Citation**

Edward P. Richards, Risk Management Theory: Reducing Liability in Corporate and Medical Environments, 19 Houston Law Review 251 (1982).

This Article is brought to you for free and open access by the Faculty Scholarship at LSU Law Digital Commons. It has been accepted for inclusion in Journal Articles by an authorized administrator of LSU Law Digital Commons. For more information, please contact [kreed25@lsu.edu](mailto:kreed25@lsu.edu).

# RISK MANAGEMENT THEORY: REDUCING LIABILITY IN CORPORATE AND MEDICAL ENVIRONMENTS

*Edward P. Richards\**  
*Abraham Silvers\*\**

## I. INTRODUCTION

There is a consensus in the business community that the traditional methods of resolving legal disputes have become too time consuming and expensive.<sup>1</sup> This has led businesses to explore various alternative strategies for dispute resolution,<sup>2</sup> and to become increasingly interested in dispute avoidance strategies such as risk management.<sup>3</sup> This article presents an analytic framework for evaluating the cost-effectiveness of risk management strategies.<sup>4</sup> The problem of cost-effectiveness is critical to the development of risk management programs because many risks may be

---

\* Of counsel, Roberts & Markel, Houston, Texas. B.A., Rice University; J.D., University of Houston. Member of Texas bar.

\*\* Associate Professor, Baylor College of Medicine; Associate Professor, University of Texas School of Public Health. B.S., University of California, Los Angeles; Ph.D., University of California, Los Angeles.

1. *The Highest Legal Fees*, NEWSWEEK, Aug. 24, 1981, at 71; *Fat Fees*, TIME, July 27, 1981, at 68; R. Banks, *Litigation Cost Control: A Xerox Case History*, CENTER FOR PUB. RESOURCES NEWS LETTER, VI, B1 (1980) to be reprinted in 1 DISPUTE MANAGEMENT: A MANUAL OF INNOVATIVE CORPORATE STRATEGIES FOR THE AVOIDANCE AND RESOLUTION OF DISPUTES, VI:B1 (1982).

2. Bodily, *When Should You Go To Court?*, HARV. BUS. REV., May-June 1981, at 103; Riskin, *Mediation and Lawyers*, 43 OHIO ST. L.J. —, — (1982). See also *Working Smarter*, FORTUNE, June 15, 1981, at 68.

3. Risk management is considered a subset of the general area of preventative law, although it is almost impossible to define a preventative law strategy that is not also a risk management strategy. This area was pioneered by Louis Brown, who has written extensively on the problems of preventative law. See L. BROWN, PREVENTATIVE LAW (1950); L. BROWN & E. DAUER, PLANNING BY LAWYERS: MATERIALS ON A NON-ADVERSARIAL LEGAL PROCESS (1978); Brown, *Preventative Law and Public Relations—Improving the Legal Health of America*, 39 A.B.A.J. 556 (1953); BROWN, AN INQUIRY INTO WHETHER PREVENTATIVE LAW SHOULD BE RANKED AS A SPECIALTY (ABA Specialization Monograph No. 2).

4. While this framework is expressed in terms of a statistical model, it is meant to be a heuristic device rather than an algorithm that can be used for calculations. Someone wishing to use this model for computations would have to collect substantial background data to make the model useful in a specific situation. Refer to text accompanying notes 9-10 *supra*.

prevented only at a cost greatly in excess of the cost of their occurrence.<sup>5</sup> A business that tried to prevent these risks would go bankrupt, even if its interventions were successful.

This article also presents a model for dealing with the complex interactions between risk factors that arise from the presence of feedback<sup>6</sup> and pipelining.<sup>7</sup> Feedback and pipelining are central problems in risk management because of the long interval between the occurrence of a risk and the eventual resolution of the resulting judicial proceedings. This delay may allow many more persons to be injured (filling the pipeline) before the business becomes aware of the risk. Pipelining can only be avoided by the development of more effective monitoring parameters than those currently used in the business environment.<sup>8</sup>

The model for dealing with these problems presents a basic set of tools to help legal planners and risk management personnel to develop strategies to more effectively monitor the performance of risk management programs. The preliminary design criteria are reviewed for establishing a risk monitoring program in a hospital, using examples that are applicable to other businesses. These criteria are necessarily rudimentary because we lack accurate data on risk management problems. A major goal of this article is to present a common framework for risk management data collection and evaluation.<sup>9</sup> This will allow the collection of data from many

---

5. The problem of cost effectiveness became critical in the medical environment when many hospitals had their malpractice insurance premiums raised 50% or more. For facilities without a history of large losses it was no longer cost effective to continue their existing insurance arrangements. See B. BROWN, *RISK MANAGEMENT FOR HOSPITALS* 5 (1979); Korsak, *Risk Management Activities Boost Effectiveness of Self-Insurance Program*, 52 *HOSP.*, Feb. 16, 1978, at 58; Larson, *Malpractice Self Insurance*, 31 *J. HOSP. MGMT.*, Aug. 1977, at 42; Ribin & Staples, *Risk Management Is More Than Buying Insurance Policies*, 32 *J. HOSP. MGMT.*, Aug. 1979, at 20.

6. Feedback occurs when the end result of a continuing process influences earlier steps in the process, either reducing the probability of the end result (negative feedback), or increasing the probability of the end result (positive feedback).

7. Pipelining is a term borrowed from the oil business. In that context it originally meant the amount of oil that had to be put into an empty pipeline before any oil came out the other end. This represented the amount of oil that would remain in the pipeline after the input was stopped. In general, pipelining represents any process that continues for a period of time after its input is stopped.

8. An example of this was the industry-wide rating system for malpractice insurance premiums that prevented individual hospitals from benefiting from their exemplary claims records. See Quinley, *Self-Insurance*, 31 *J. HOSP. MGMT.*, Nov. 1977, at 20.

9. The desire to quantify legal analysis is as old as jurisprudence itself, but the most succinct statement of the problem was by Judge Cardozo: "They do things better with logarithms." B. CARDOZO, *THE PARADOXES OF LEGAL SCIENCE* 1 (1928). See also Vanyo, *The Le-*

different sources and the integration of this data into a general model of risk management intervention.<sup>10</sup>

## II. THE ECONOMICS OF RISK MANAGEMENT

Risk management efforts must save more money than they cost if they are to be acceptable to business. It does not make economic sense to spend \$100 to prevent a risk whose occurrence will cost only ten dollars.<sup>11</sup> While it may be socially desirable to prevent injuries to workers, a corporation would cheat its shareholders if it spent more to prevent injuries than it saved through those expenditures.<sup>12</sup> In most situations it is cost-effective to prevent injuries, but this decision must be based on economic data, not on appeals to corporate paternalism. The old corporate controls based on government regulation have proven unacceptable, but corporations have begun to realize that the alternative of regulation through litigation can be much more costly than government regulation.<sup>13</sup> This new litigation climate demands that corporations quickly develop mechanisms to manage risks, lest they face catastrophic losses from unanticipated litigation.

There are three contributions to the cost of risk taking behavior. The first is the direct cost due to the occurrence of the risk. This includes the loss of skilled personnel, machine downtime, and other factors that reduce productivity, as well as the payment of compensation to the injured party. The second is the cost of the efforts to prevent or manage the risk before its occurrence. The

---

*gal System Can it Be Analyzed to Suit the Scientist?*, in *SCIENTISTS IN THE LEGAL SYSTEM* (W. Thomas ed. 1974).

10. For a discussion of the importance of model building, see R. POUND, *SOCIAL CONTROL THROUGH LAW* (1942). As Professor Pound stated: "Theories of what is have a marked effect upon ideas of what ought to be. Men tend to do what they think they are doing." *Id.* at 26. Another commentator has noted that "[t]he function of a general theory of law is not to discover the immediate sources of law, however important that may be in the study of a particular area, but to segregate the factors which operate in all areas in the creation, modification, transformation and disappearance of legal systems." H. CAIRNS, *THE THEORY OF LEGAL SCIENCE* 89 (1969).

11. For an analysis of the economic basis of tort law and its impact on risk taking, see Stevens, *Medical Malpractice: Some Implications of Contract and Arbitration in HMO's*, 59 *MILBANK MEMORIAL FUND Q./HEALTH AND SOCIETY*, 59, 66 (1981). See also C. STONE, *WHERE THE LAW ENDS, THE SOCIAL CONTROL OF CORPORATE BEHAVIOR* 33 (1975).

12. This is certainly true if the expenditures caused the corporation to go out of business. For a discussion of the merits of this view in less drastic circumstances, see C. STONE, *supra* note 11, at 75.

13. See, e.g., *Borel v. Fibreboard Paper Prods. Corp.*, 493 F.2d 1076 (5th Cir. 1973), cert. denied, 419 U.S. 869 (1974).

third is the cost of the new risks that arise from the efforts to control the existing risks.<sup>14</sup> The complications that arise from medical laboratory tests that are ordered because of a fear of malpractice suits are a good example of these newly created risks. It would be very difficult to defend a patient injury from a medically unnecessary test. The cost of these new risks can be important during the initial phase of a new risk management program when their cost is added to the cost of the claims incurred before the start of the new program whose effects are still being felt. After these initial costs are absorbed, the costs of the risk management activities will be offset by the decreased losses due to the reduced incidence of existing risks. There will come a point of diminishing returns however, where the costs of the risk management program will no longer be offset by the savings from the reduced incidence of existing risks.

To put the problem of diminishing returns into a mathematical shorthand, let  $C_R$  represent the total cost of risk management activities; let  $C_O$  represent *the costs due to the occurrence of risk*; let  $C_D$  represent the direct cost of risk management efforts; let  $C_{ID}$  represent the indirect cost of risk management activities due to the creation of new risks; and let  $L$  represent the total losses related to risks. Then the total losses will equal the sum of the costs related to the occurrence of risks and the total costs of the efforts to prevent the risks:

$$L = C_O + C_R$$

The total cost of the efforts to prevent the risks will equal the money directly spent on risk management efforts, plus the costs due to the new risks that are created:

$$C_R = C_D + C_{ID}$$

When there are no expenditures for risk management efforts, there will also not be any indirect losses due to the creation of new risks. At this point the cost of the occurrence of risks will be the total losses of the program. If it is assumed that risk management efforts will have some effect on reducing the costs due to the occurrence of risks, then the costs of the occurrence of existing risks should be at their maximum value when the expenditures for risk management activities are zero.

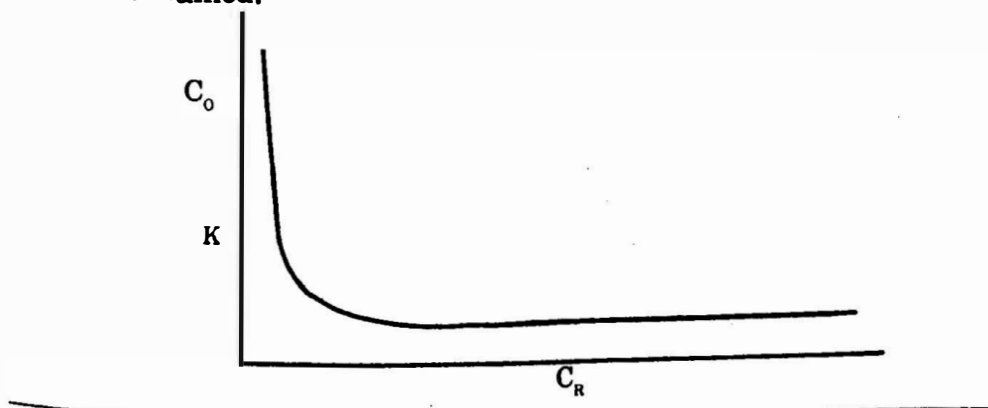
When the business begins to spend money on risk manage-

---

14. For a discussion of the costs associated with the use of extra x-rays, see *Managing Severe Head Injury, Doing More and Faring Worse?*, 1980 LANCET 1229.

ment activities, the costs due to the occurrence of risks will decrease. This reduction will continue until all the preventable risks are eliminated, leaving only an irreducible baseline cost due to the occurrence of unpreventable risks. Because it is impossible to prevent all risks,<sup>15</sup> the costs due to the occurrence of risks can only be reduced to this baseline level. At the same time that the increased expenditures for risk management efforts are reducing the costs due to the occurrence of risks, the costs due to the occurrence of new risks created by the risk management efforts will be increasing. Since the total cost of the risk management program includes both the direct expenditures for risk management activities and the indirect costs arising from the creation of new risks, then the total cost of the risk management program will always be greater than the budgeted expenditures.

These relationships imply that the costs resulting from the occurrence of risks are inversely related<sup>16</sup> to the total cost of the risk management efforts. This inverse relationship holds to the point where the costs due to the occurrence of risks have been reduced to their minimum level. Once this minimum level has been reached, further expenditures for risk management activities will not reduce the costs due to the occurrence of risks. If the total costs of risk management activities ( $C_R$ ) are plotted against the costs due to the occurrence of risks ( $C_O$ ), with ( $K$ ) representing the minimum cost of existing risks, then a graph of the following type will be obtained:



15. Judge Bazelon once stated that "[t]he question is then not whether we will have risk at all, but how much risk and from what source." Bazelon, *Risk and Responsibility*, 205 SCIENCE 277 (1979).

16. An inverse relationship means that one quantity decreases when another quantity increases. This may be a direct relationship such as when a one-dollar increase in risk management expenditures results in a one-dollar drop in the costs due to risks, or it may be more complex involving the quantification of nonmonetary benefits.

It is only the basic type of the curve that is important.<sup>17</sup> It is impossible to establish a value for any of the points along the curve without actual data on the costs and benefits of the particular risk management system under study.

Since the total losses related to risks are equal to the sum of the costs due to the occurrence of risks (both new and old) and the cost of the risk management activities, the curve illustrates that there will be a point where it is not cost effective to spend more money on risk management activities. Once this point is reached, the added expenditures will not result in a corresponding decrease in the losses due to the occurrence of risks. This is the optimal operating point for a risk management program, and can only be recognized by careful analysis of the decrease in the costs due to the occurrence of risks for each increase in direct risk management expenditures. By using this operating point as a reference, it is possible to set up five risk classes, based on the economic consequences of the occurrence of specific individual risks:

1. *Prevented risks.* Risks whose cost of occurrence is higher than their cost of management, and whose occurrence may invoke additional legal sanctions. This class would include intentional torts and injuries caused by gross negligence.<sup>18</sup>
2. *Normally prevented risks.* Risks whose cost of occurrence is greater than the cost of their management, but whose occurrence will only be considered negligent. This class includes most negligent injuries and most type of products liability actions.<sup>19</sup>

---

17. The important characteristics of this curve are that it intercepts the Y axis (where the costs due to the occurrence of risks have a highest value) and it reaches a limit (the baseline cost of unpreventable risks) despite further increases in the expenditures for risk management activities.

18. See, e.g., *Toole v. Richardson-Merrell, Inc.*, 251 Cal. App. 2d 689, 60 Cal. Rptr. 398 (1967), where the court noted the following:

From all of the evidence the jury could find that appellant acted recklessly and in wanton disregard of possible harm to others in marketing, promoting, selling and maintaining MER/29 on the market in view of its knowledge of the toxic effects of the drug. Such a finding would necessarily be a finding of malice in fact, and since the jury was instructed only on malice as a foundation for an award of punitive damages and made such an award in respondent's favor, we must presume that they found malice in fact.

*Id.* at 715, 60 Cal. Rptr. at 416.

19. For example, it is generally recognized that a surgeon's failure to remove a sponge before closing the incision is negligence as a matter of law. See, e.g., *Thompson v. Barnard*, 142 S.W.2d 238, 240 (Tex. Civ. App.—Waco 1940), *aff'd* 138 Tex. 277, 158 S.W.2d 486

3. *Managed risks.* Risks whose cost of occurrence is only slightly greater than their cost of management. The plaintiff usually has the burden of showing that the defendant owed him or her a special duty to recover for one of these risks.<sup>20</sup>
4. *Unprevented risks.* Risks whose cost of occurrence is less than their cost of management. The classic example of this class is the cost of railroad crossing barriers compared to the damages sustained by people who are hit by trains.<sup>21</sup>
5. *Unpreventable Risks.* Risks whose occurrence is unmanageable.<sup>22</sup>

The assignment of a risk to one of these classes is a major problem in risk management because the class of a risk determines how much effort must be expended to prevent the risk. The misclassification of a prevented or normally prevented risk as a managed or unprevented risk can result in large financial losses. For example, a hospital that does not update obsolete procedures such as inaccurate monitoring of oxygen in the premature nursery would be liable for any injuries attributable to this failure to update procedures.<sup>23</sup> These classifications must be reviewed periodically to determine if the cost of the risk taking behavior has changed, altering the classification of the risks.

### III. CALCULATING THE COST OF RISK TAKING BEHAVIOR

There are two parties to risk taking, the party with the responsibility for managing or preventing the risk (the riskor), and the party who is injured by the occurrence of the risk (the riskee).

---

(1942).

20. See W. PROSSER, HANDBOOK OF THE LAW OF TORTS 244-45 (4th ed. 1971).

21. There are thousands of railroad/highway intersections that do not have warning devices to signal the approach of an oncoming train. These unguarded intersections result in a certain number of accidents each year forcing the railroad to pay out compensation to the injured parties in many cases. Yet the total cost of these payments is much lower than the cost of providing the signaling devices that would prevent these accidents. See W. PROSSER, *supra* note 20, at 148.

22. These risks include acts of God, acts of war, and force majeure. The riskor is ordinarily not liable for damages for the occurrence of these risks unless the riskor contributed to the damage caused by the risk through negligence, such as not using proper earthquake design criteria. See, e.g., J. MURRAY, CONTRACTS 390-91 (1974).

23. Air Shields, Inc. v. Spears, 590 S.W.2d 574, 581 (Tex. Civ. App.—Waco 1979, writ *ref'd n.r.e.*).



When a risk occurs, the riskor suffers certain direct costs. The riskor will spend a certain amount to determine whether, and how much, the riskee should be paid in compensation for the injury, and will then pay the riskee the determined amount. The total cost to the riskor will be the sum of the cost of the reduced productivity, the cost of evaluating the claim for compensation, and the actual compensation payment. These costs are independent of the amount that the riskor may have spent on risk management efforts, except to the extent that the risk management efforts mitigated the damage caused by the occurrence of the risk. This independence derives from the legal practice of determining the damages due an injured person without reference to the status of the party responsible for the injury.<sup>24</sup> This means that while risk management efforts may show good faith on the part of the riskor, they will only reduce the cost of a risk by the actual amount that the damages are mitigated; there is no allowance for unsuccessful efforts. These costs become interrelated in the situations where the courts consider the behavior or status of the riskor:

(1) *When there is a statutory penalty involved.* The criminal penalties for misprescribing narcotics are an important example;<sup>25</sup>

(2) *When the injury resulted from an intentional or grossly negligent act.* When this occurs, the court allows the award of punitive damages;<sup>26</sup>

(3) *When the law limits the compensation that may be paid in order to protect the riskor from financial loss.* This is the effect of the workers' compensation laws, and the specific purpose of many statutes limiting the recovery of damages in medical malpractice suits;<sup>27</sup> and

(4) *When a comparative negligence standard is used.* While comparative negligence is seldom used in the trial of a medical malpractice suit, negligence on the part of the patient (not returning for follow-up care, for example) can weaken the proof of causation and drastically lower the settlement value of the case.<sup>28</sup>

In each of these situations there has been a public policy deci-

---

24. BALDWIN, *Damages in Personal Injury and Death Cases*, in *DAMAGES* E-1 to 19 (State Bar of Texas 1977).

25. Dangerous Drugs Act, TEX. REV. CIV. STAT. ANN. art. 4476-14 (Vernon 1976).

26. Refer to note 18 *supra*.

27. Medical Liability and Insurance Improvement Act, TEX. REV. CIV. STAT. ANN. art. 4590i (Vernon Supp. 1982).

28. See generally W. PROSSER, *supra* note 20, at 416.

sion that the cost to society should be considered when damages are assessed against the riskor. This is because the relationship between the cost of the occurrence of a risk and the cost of managing the risk determines how vigorously the corporation will attempt to manage the risk.<sup>29</sup> Society can only effectuate its policies by altering the relationship between the cost of the occurrence of a risk and the cost of managing the risk.<sup>30</sup> The riskor will best balance its needs against those of the individual workers, and of society as a whole, when the worker receives enough to be made whole, and the cost of the occurrence of the risk is greater than the cost of preventing the risk. In general, there are four types of situations: when the compensation payment does not make the original riskee whole, then the riskee may be unwilling to be exposed to the risk; when the compensation payment is more than the amount needed to make the riskee whole, then the riskee may contribute to the occurrence of the risk; when the cost of the occurrence is less than the cost of managing the risk, then the original riskor will not have an incentive to prevent the risk;<sup>31</sup> and when the cost of the occurrence is much higher than the cost of managing the risk, the riskor may totally prevent the risk by not engaging in the business that causes the risk, at the expense of the benefits to society that are normally gained from this business.<sup>32</sup>

When the cost of managing a risk greatly exceeds the cost of the occurrence of the risk, the riskor may allow the occurrence of risks whose cost to society is unacceptably high.<sup>33</sup> Since existing

---

29. For a mathematical analysis of the optimal level of malpractice litigation, see Schwartz & Komesar, *Doctors, Damages, and Deterrence*, 298 NEW ENG. J. MED. 1282 (1978) (concluding that there are too few suits to provide an incentive to improve medical care).

30. But see C. STONE, *supra* note 11, at 91.

31. For example, in the criminal proceeding against Richardson-Merrell for lying to the Food and Drug Administration about the hazards of MER/29, the company pleaded no contest, and was fined only \$80,000. *Id.* at 56.

32. While many insurance companies have maintained that the cost of products liability insurance has driven many products off the market, it is difficult to pinpoint an example of a beneficial product that is unavailable because of insurance costs.

33. In this regard, Stone offers the following example:

In April 1960 the FDA granted Richardson-Merrell's application to market MER/29. The drug was not on the market long before evidence of alarming symptoms began to come to Richardson-Merrell's attention. It (the evidence) was almost all intercepted at various levels of the corporation and not turned over to the FDA. Denials and whitewashing of the drug continued until, in May 1962, its dangers had become so generally evidenced that the FDA ordered it withdrawn. In that two year marketing period, however, 400,000 people had taken it. In the first

legal remedies provide an insufficient incentive for the riskor in these situations, society must impose further sanctions if it is to shift the cost/benefit ratio toward prevention. The federal laws requiring automobile manufacturers to install seat belts, with substantial economic penalties for noncompliance, is an example of this type of sanction.

In the situations where the compensation payment is not sufficient to make the riskee whole, the remaining cost of the injury must be borne by society. Society may bear this cost directly, through charitable medical care and disability payments, for example, or it may bear it indirectly through loss of the individual's productivity or resources. This cost to society is an indirect subsidy to the riskor.<sup>34</sup> Ideally, the indirect subsidy will be less than the benefit to society of allowing the riskor to avoid paying the full costs of the injuries for which it is responsible. For example, the actual effect of the workers' compensation laws is to shelter employers from the full cost of employee injuries.<sup>35</sup> It is important for policymakers to understand that this sheltering causes the cost of these injuries to be spread among society as a whole,<sup>36</sup> an unacceptable result if the subsidy does not result in general benefits that offset the cost to society of the subsidy.<sup>37</sup>

#### IV. THE ANALYSIS OF RISK TAKING

There are a minimum of three events involved in the loss of money due to the occurrence of a risk. The first is an injury caused by the occurrence of a risk, the second is a claim for compensation, and the third is the payment of the claim for compensation. In the simplest case, all injuries will be linked to a claim for compensation, and all claims will result in a full payout of the amount of the claim.

These three basic transactions do not occur at this simple level

---

year alone it added \$7,000,000 to Richardson-Merrell's gross sales.

C. STONE, *supra* note 11, at 55.

34. See generally *id.* at 37.

35. See Provost & Richards, *The Company Doctor's Responsibility to the Employee*, TRIAL, July 1981, at 35.

36. See, e.g., Miller, *Occupational Safety*, TRIAL, July 1981, at 47 ("[I]f employee is spared having to install certain . . . equipment, that employer will save 'costs.' Many of these costs, however, . . . are . . . passed on to others . . .").

37. As noted by Miller, "[W]e have learned recently that 80 percent of the costs of occupational diseases are currently borne by the public through Social Security disability payments, welfare, veterans' benefits, Medicare and Medicaid. . . ." *Id.*

in the real world. Not all riskees will be injured. Some injuries will not result in a claim for compensation, and few claims will result in a 100% payout of the requested amount. Because of this uncertainty, it is more appropriate to speak of the probability<sup>38</sup> that the risk will occur, the probability that the riskee will claim compensation, and the probability that this compensation will be awarded. Each of these events has a certain probability of happening; the probability of each event is dependent upon the others.<sup>39</sup> It is this mutual dependence that prevents the use of the simple conditional Bayesian Theorem that has previously dominated attempts to apply probability theory to legal analysis.

Most of the previous attempts to apply quantitative methods to legal problems have used Bayes' Theorem.<sup>40</sup> The underlying assumption of Bayes' Theorem is that the probability of an event occurring can be determined by combining the probabilities of the events precedent, and that the probabilities of these events are independent.<sup>41</sup> Some of these analyses were performed on criminal law problems in hope of reducing the uncertainty of the criminal law process, but this goal was not reached for two fundamental reasons. First, in most legal situations, the probabilities of prior events are not independent; and second, the criminal law process is based on a presumption of innocence.<sup>42</sup> This presumption demands that the probability of the accused being guilty must be set close to zero.<sup>43</sup> As any term approaches zero, Bayes' Theorem is no longer

38. For example, the probability of drawing an ace from a deck of cards is 1 in 13. See generally J. FLEISS, *STATISTICAL METHODS FOR RATES AND PROPORTIONS* 1 (1981).

39. *Id.* at 2.

40. The main proponent of the Bayesian Theorem has been Michael Finklestein. Mr. Finklestein is a practicing attorney whose work has been very innovative, if controversial. See M. FINKLESTEIN, *QUANTITATIVE METHODS IN LAW: STUDIES IN THE APPLICATION OF MATHEMATICAL PROBABILITY AND STATISTICS TO LEGAL PROBLEMS* (1978), reviewed by Kaye, *Naked Statistical Evidence*, 89 YALE L.J. 601 (1980); Fairley, *Probabilistic Analysis of Identification Evidence*, 2 J. LEGAL STUD. 493 (1973); Finklestein & Fairley, *A Comment on "Trial by Mathematics"*, 84 HARV. L. REV. 1801 (1971); Finklestein & Fairley, *A Bayesian Approach to Identification Evidence*, 83 HARV. L. REV. 489 (1970); Kaye, *Probability Theory Meets Res Ipsa Loquitur*, 77 MICH. L. REV. 1456 (1979); Kaye, *The Laws of Probability and the Law of the Land*, 47 U. CHI. L. REV. 34 (1979); Kaye, *The Paradox of the Gatecrasher and Other Stories*, 1979 ARIZ. ST. L.J. 101 (1979); Tribe, *A Further Critique of Mathematical Proof*, 84 HARV. L. REV. 1810 (1971); Tribe, *Trial by Mathematics: Precision and Ritual in the Legal Process*, 84 HARV. L. REV. 1329 (1971).

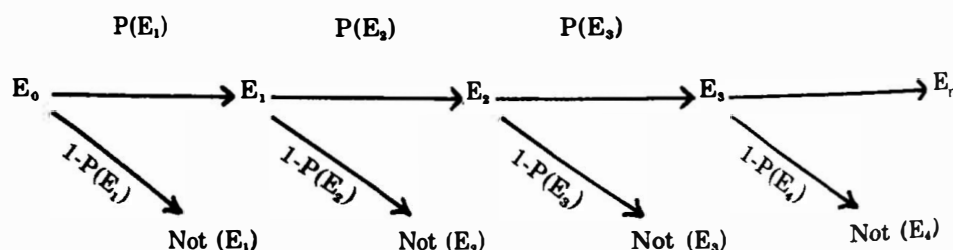
41. See J. FLEISS, *supra* note 38, at 4-11.

42. See, e.g. TEX. CODE CRIM. PRO. ANN. art. 38.03 (Vernon 1979).

43. "The most problematic feature of Bayes' Theorem in the criminal trial context (or any trial) is quantifying the initial probability of guilt (or liability in civil proceedings)—P(X). If a presumption of innocence makes that variable equal zero, the formula is

an effective model. In order to circumvent this limitation, it is necessary to assume that it is relatively likely that the accused did commit the crime, an assumption that is philosophically unacceptable.

In order to develop an effective description of risk taking behavior, it is useful to use a tree diagram of the events involved. Let  $E_0$  denote the status quo, let  $E_1$  denote the occurrence of a risk, let  $E_2$  denote the occurrence of a claim for compensation, let  $E_3$  denote the occurrence of a payout, and in general let  $E_n$  represent the end of the chain. Further, let  $P(E_1)$ ,  $P(E_2)$ ,  $P(E_3)$ , and  $P(E_n)$  denote the probability of the corresponding events,  $E_1$ ,  $E_2$ ,  $E_3$ , and  $E_n$ , respectively. Then:



In this diagram the probability of a risk occurring is  $P(E_1)$ , and the probability of the risk not occurring is  $1 - P(E_1)$ .<sup>44</sup> The general probability of an event  $E_n$  occurring is  $P(E_n)$ , while the general probability of an event not occurring is  $1 - P(E_n)$ . The odds<sup>45</sup> of an event occurring are the probability of the event occurring divided by the probability of the event not occurring:

$$\frac{P(E_n)}{1 - P(E_n)}$$

The odds of an event occurring are a more useful monitor for that event than is its probability of occurring because odds are more easily understood by administrative or legal personnel.<sup>46</sup> The

simply unworkable." Comment, *Probability Theory and Constructive Possession of Narcotics: On Finding that Winning Combination*, 17 Hous. L. Rev. 541, 558-59 (1979).

44. In this simple model, the probability that the risk will not occur is  $(1 - \text{the probability that the risk will occur})$  when the probabilities are expressed as percentages.

45. See J. FLEISS *supra* note 38, at 44.

46. "Words are the lawyer's stock in tirade [sic?]. He would rather face a page of fine print than a simple algebraic formula." Lozowick, Steiner, & Miller, *Law and Quantitative Multivariate Analysis: An Encounter*, 66 MICH. L. REV. 1641, 1641 (1968). See also H. KYBURG, *THE LOGICAL FOUNDATIONS OF STATISTICAL INFERENCE* 96 (1974) ("[A] bookmaker had better be jolly sure that the odds he posts satisfy the axioms of the probability

odds of a risk occurring, a claim being filed, and compensation being paid are interdependent. This is significant because it is this interdependence that leads to feedback and pipelining.

## V. FEEDBACK AND PIPELINING

Feedback is an electrical engineering term<sup>47</sup> that has crept into general usage. As used in this article, it represents the principle that the output of a process affects earlier steps in the process. Feedback is positive when it stimulates the process, and it is negative when it inhibits the process. In the context of this discussion of risk management theory, feedback refers to the effect that changes in the odds of events occurring have on the odds of other, related events occurring. Products liability law provides a good example of feedback.

In the early development of products liability law it was very difficult for an injured person to recover compensation from a product manufacturer. The defense of privity<sup>48</sup> cut off most actions, and the remainder were defeated by the difficulty of showing negligence in manufacture.<sup>49</sup> This resulted in negative feedback because the payouts for lawsuits were very low. This discouraged attorneys from filing products liability claims, lowering the odds that an injury would be linked to a lawsuit. The low odds of a payout in turn reduced the riskor's incentive to make safer products.

When the courts abolished the privity defense<sup>50</sup> and adopted various types of strict liability standards, it became easier for a plaintiff to win a reasonable payout.<sup>51</sup> These reasonable payouts increased the chance that an injured person would file a claim for compensation (increasing linkage), and provided an incentive for

---

calculus,").

47. For a direct analogy between electrical engineering and law, see H. ODUM, ENVIRONMENT, POWER, AND SOCIETY 226 (1971) ("As systems become old and complex, special energies may go into conserving network features through the institution of law. Law may be defined as a formal statement of a switching network and its formal alternatives.").

48. "The law of products liability began with the case of *Winterbottom v. Wright*. . . which has been described as a fishbone in the throat of the law. . . . [*Winterbottom* established early] the general rule that the original seller of goods was not liable for damages caused by their defects to anyone except his immediate buyer or one in privity with him." W. PROSSER, *supra* note 20, at 641.

49. *Id.* at 642.

50. J. SALES & J. PERDUE, THE LAW OF STRICT TORT LIABILITY IN TEXAS 126 (1977).

51. *Greenman v. Yuba Power Prods., Inc.*, 59 Cal. 2d 57, 377 P.2d 897, 27 Cal. Rptr. 697 (1963).

risks to produce safer products. This positive feedback dramatically changed products liability law from an unimportant area of practice to a major area of litigation.

Feedback usually results in the gradual evolution of the law, but it can cause dramatic shifts, rapidly changing the way law is practiced. These rapid shifts usually follow legislative actions, such as the enactment of the equal employment legislation,<sup>52</sup> or major judicial reinterpretations of existing laws, such as the *Roe v. Wade* abortion decision.<sup>53</sup> In the usual course of events there is a five- to ten-year inertial period between the development of a new legal theory and its adoption by the majority of the legal profession. It is this inertia that provides the greatest risk management challenge—the problem of the delayed recognition of important new risks due to the lack of litigation pressure.

The delayed acceptance of new legal theories results in a period when the riskor is potentially liable for the consequences of the risks affected by the new theory, but the probability of being sued (linkage) is very low. The riskor will use one of three strategies in this situation: implement an effective risk management program, accepting that it will not be cost effective during the transition period; continue the status quo, saving money initially but losing money in the longer term; or implement a limited (sham) risk management program that will appear effective because of the low probability of being sued.

The implementation of sham risk management programs is the usual response to a new legal development. The most common example of a sham program is the establishment of an incident reporting system without establishing a method of preventing the identified risks.<sup>54</sup> This can be the most financially risky choice if it

---

52. 42 U.S.C. §§ 2000e to 2000e-17 (1976 & Supp. III 1979).

53. *Roe v. Wade*, 410 U.S. 113 (1973).

54. This problem usually arises when an incompetent or impaired medical staff member is identified. The politics of medical staffing decisions normally make it very difficult to discipline a member of the medical staff. For the legal consequences of this problem, see *Kelsey-Seybold Clinic v. Maclay*, 466 S.W.2d 716 (Tex. 1971); R. BROOK, *QUALITY OF CARE ASSESSMENT: A COMPARISON OF FIVE METHODS OF PEER REVIEW* (1973); Annas, *Who to Call When the Doctor is Sick*, HASTINGS CENTER REP., Dec. 1979, at 18; Carroll, *Disciplining the Errant Physician: In Virginia, Investigations Show an Increase*, 106 VA. MED. J. 400 (1979); Dunn, *Hospital Corporate Liability: The Trend Continues*, 8 MEDICOLEGAL NEWS, Oct. 1980, at 16; Felch & Halpern, *Coping with Physician Incompetence*, 79 N.Y. ST. J. MED. 1921 (1979); Freilich, *Verification of Physician Credentials*, 80 N.Y. ST. J. MED. 1997 (1980); Hirsch, *The Medical-Legal Implications of the Problem of the Errant or Sick Physician*, 82 CASE & COMMENT, July-Aug. 1977, at 23; *The Man Who Never Comes Back*, 2

delays the implementation of an effective risk management program while it documents risks that are not properly managed. It is this type of delayed action that leads to pipelining.

Pipelining is the accumulation of unrecognized liability. This occurs when a riskor maintains the status quo approach (or a sham program) to managing a specific risk, while the probability of a payout due to that risk has been substantially increased. Changes in payout can be overlooked for a certain period of time because of the long interval between the occurrence of an injury and the payment of a claim for compensation. In medical malpractice litigation, for example, this delay can be five years or more. During this period, a large number of persons can be injured before the riskor becomes aware of the accumulating liability. A dramatic example of pipelining occurred at the University of California at Davis Medical School. Over a twenty-two-month period, the cardiac surgery and kidney transplant services experienced a dramatic rise in morbidity and mortality. This became public when university physicians stopped referring patients to the affected services. Once the injured patients became aware of the problem, they filed \$500,000,000 in lawsuits.<sup>55</sup>

Most cases of pipelining result from the short-term management goals of many managers. These short-term goals can also cause an effective program to be abandoned. Just as inertia can cause an ineffective risk management program to be continued while a pipeline of injured persons accumulates, an effective risk management program can be discontinued because of the losses that are paid during the start-up phase of the program, but whose cause was several years earlier. The only effective protection against both pipelining and the abandonment of an effective program is the development of short-term monitors of risk management performance, coupled with a constant surveillance of feedback effects.

---

LANCET 1358 (1979); Talbott & Benson, *Impaired Physicians: The Dilemma of Identification*, 66 POSTGRADUATE MED., Dec. 1980, at 56; and Williamson, Braswell, Horn & Lohmeyer, *Priority Setting in Quality Assurance: Reliability of Staff Judgment in Medical Institutions*, 16 MED. CARE 931 (1978).

55. TIME, July 20, 1981, at 72.



## VI. MONITORING RISK MANAGEMENT PROGRAMS

A. *Conditional Odds*

It is basic to the development of an effective risk management program that the factors that influence the odds of the occurrence of each event be identified. For example, the odds of a lawsuit's being filed after an injury (the "linkage" between the injury and the filing of the lawsuit) are equal to the probability of the suit's being filed divided by the probability of the suit's not being filed:

$$\frac{P(\text{LINKAGE})}{1 - P(\text{LINKAGE})}$$

There are many factors that can influence the odds of a worker's filing a lawsuit. For example, one major factor is whether the worker is a member of a strong union.<sup>56</sup> In this situation we would discuss the odds of a worker's filing a lawsuit, contingent upon whether that worker is a union member. Those are the conditional odds: we are interested in how the condition of being a union member affects the odds of a worker's filing a lawsuit. This would be expressed as the probability of a union member's filing a lawsuit, divided by the probability of a union member's not filing a lawsuit:

$$\frac{P(\text{LINKAGE} / \text{UNION MEMBERSHIP})}{1 - P(\text{LINKAGE} / \text{UNION MEMBERSHIP})}$$

The probability of a lawsuit's being filed can be conditioned by as many factors as can be identified.<sup>57</sup> The general form for expressing the conditional probability that an injury will be linked to a lawsuit is:

$$P(\text{LINKAGE} / C_1, C_2, C_3 \dots C_n)$$

In this expression  $C_1$  could represent union membership,  $C_2$  could represent the worker's age,  $C_3$  could represent the worker's job classification, with additional  $C$  terms being added for each factor that is identified. The general form for the conditional odds of a worker's filing a lawsuit would then be:

---

56. Union members are protected from arbitrary firings by the grievance process. This makes them more likely to take legal action against their employer than nonunion employees.

57. Contrast these conditional factors with Hohfeld's "operative facts." See, e.g., W. HOHFELD, *FUNDAMENTAL LEGAL CONCEPTS AS APPLIED IN JUDICIAL REASONING* (1978).

$$\frac{P(\text{LINKAGE} / C_1, C_2, C_3, \dots C_n)}{1 - P(\text{LINKAGE} / C_1, C_2, C_3, \dots C_n)}$$

This same type of conditional statement could be set up for the odds of the occurrence of the risk itself,<sup>58</sup> the odds of a payout,<sup>59</sup> or the odds of any other event<sup>60</sup> that could be added to the chain.<sup>61</sup> Using the example of products liability litigation, we would determine that the odds of an attorney's filing a products liability claim (the linkage of an injury to a lawsuit) is conditioned by privity (before this was abolished), by the standard used for liability, and by the potential payout. Thus:

$$\frac{P(\text{LINKAGE/PRIVITY, LIABILITY, PAYOUT})}{1 - P(\text{LINKAGE/PRIVITY, LIABILITY, PAYOUT})}$$

It is the identification and tracking of these conditional factors that form the basis of effective risk management programs. Changes in these conditional factors will presage changes in the odds of the major events' being monitored, giving the riskor advance warning of incipient problems. The tracking of these factors involves standard data processing techniques such as trend analysis,<sup>62</sup> but the factors themselves will differ in each different risk environment. For example, in a hospital the risk manager will monitor such factors as patient satisfaction, compliance with therapy, and medication errors, while in a steel mill the risk manager will monitor visits to the medical department, requests for safety equipment, and sick leave. The same mathematical techniques could be used, although the data themselves would be completely different. The main caveat in designing these tracking programs is that the mathematical techniques used do not mask the occurrence of unusual events that can disproportionately influence liability.

### B. Outliers

Outlier is the mathematical term for an unusual event that can have a disproportionate effect on the process being monitored because the event lies outside of the expected range for the data. An outlier may be a catastrophic event, such as incinerating a pa-

58.  $P(\text{RISK} / C_1, C_2, C_3, \dots C_n)$ .

59.  $P(\text{PAYOUT} / C_1, C_2, C_3, \dots C_n)$ .

60.  $P(\text{EVENT} / C_1, C_2, C_3, \dots C_n)$ .

61. For a philosophical discussion of the interdependence of legal events, see G. HEGL, *NATURAL LAW* 60 (1975).

62. C. OSTROM, *TIME SERIES ANALYSIS: REGRESSION TECHNIQUES* 9 (1978).

tient,<sup>63</sup> or it may be an unusual trend, such as an excess of respiratory deaths during a certain time period.<sup>64</sup> Outliers are important because they usually represent the type of prevented or normally prevented risk that can lead to large financial losses. Since most commonly used statistical techniques mask outliers by averaging them into the bulk of the data, the data must be scanned, either manually or electronically, to identify any outliers. This process of identification is called flagging, from the data processing technique of marking certain types of data with codes called flags. It is important to realize that a point may be an outlier because it is out of the range normally observed by the specific riskor, or it can be an outlier because it is outside the range of values observed by similar riskors. In the second case it can violate the standard of care required, even though it is within the range usually observed by the individual riskor. It is the identification of these "community standard" outliers that demands an effective means of sharing risk management data among riskors. The analysis of conditional factors and outliers is important in demonstrating the effectiveness of new risk management strategies in situations where there is a substantial residual liability obscuring the effectiveness of the new program. If the manager can demonstrate favorable trends in the conditional factors and reduce the number of outliers, he will be able to legitimate the new program despite the "pipeline" of past claims that must be paid. Such analysis is critical to insure that an effective strategy will not be discarded because of the inertia of the system being managed. The remainder of this paper will illustrate the use of this method by analyzing the problem of acceptance of risk in the medical environment, using the same methods that would be used to analyze risk taking behavior in other situations.

## VII. MANAGING MEDICAL LEGAL RISKS

The management of the legal risks that arise in the medical environment involves activities that reduce the odds of the risks' occurring, and activities that reduce the odds of the injured pa-

---

63. *Thomas v. St. Joseph Hosp.* 618 S.W.2d 791 (Tex. Civ. App.—Houston [1st Dist.] 1981, writ filed).

64. A murderer in the Ann Arbor, Michigan, Veterans Administration Hospital was able to kill eight patients with a respiratory depressant, and poison 40 others before the hospital became aware of the problem, even though the events took place in only a 30-day period. *NEWSWEEK*, Sept. 1, 1975, at 19.

tient's seeking compensation after a risk has occurred.<sup>65</sup> This discussion will focus on the second group of activities—those that reduce the odds that an injured patient will sue the provider for compensation. The methods that are described are applicable to both activities, but the second group best illustrates the significance of the conditional factors.

Medical care delivery is fraught with both negligent and non-negligent risks. The success of a medical risk management strategy will be determined by its effectiveness in persuading injured patients to accept their injuries as an unavoidable complication of their medical care. It is important to differentiate this *acceptance* of risk from the defense of *assumption* of risk.

The classic statement of the assumption of risk defense is in Prosser's *Law of Torts*:

In its simplest and primary sense, assumption of risk means that the plaintiff, in advance, has given his consent to relieve the defendant of an obligation of conduct toward him, and to take his chances of injury from a known risk arising from what the defendant is to do or leave undone.<sup>66</sup>

. . . .

The defense of assumption of risk is in fact quite narrowly confined and restricted by two requirements: first, that the plaintiff must know and understand the risk that he is incurring, and second, that his choice to incur it must be entirely free and voluntary.<sup>67</sup>

The limits of this defense are sufficiently great that it is seldom possible to persuade a jury that a medical malpractice plaintiff should not win a recovery because the plaintiff assumed the risk of

---

65. For an overview of medical risk management, see LAMBERT, *MODERN MEDICAL MISTAKES* (1978); Benesch, *Risk Management in Pennsylvania Hospitals: Panacea or Poison?*, 47 *INS. COUNS. J.* (1980); Bryant & Korsak, *Who is the Risk Manager and What Does He Do?*, 52 *HOSP.*, Jan. 16, 1978, at 42; Groves & Korsak, *Draft Job Description Provides Model for Risk Manager Position*, 52 *HOSP.*, June 16, 1978, at 70; Hirsch, *Risk Management—The Physician's Role*, 7 *LEGAL ASPECTS OF MED. PRAC.* 49 (1979); Korsak, *Risk Management Activities Boost Effectiveness of Self-Insurance Program*, 52 *HOSP.*, Feb. 16, 1978, at 58; Kucera & Ator, *Risk Management*, 32 *J. HOSP. MGMT.*, Oct. 1978, at 26; Schwegel, *Physicians Join in Efforts to Reduce Risks*, 8 *HOSP. MED. STAFF*, Nov. 1979, at 2; Stearns & Fox, *Assessing Quality Assurance and Risk Management Activities: A Profile Analysis*, 5 *QUALITY REV. BULL.*, Oct. 1979, at 26; Stewart, *Risk Management: No Task for the Timid*, 34 *TRUSTEE*, Apr. 1979, at 10.

66. W. PROSSER, *supra* note 20, at 440.

67. *Id.* at 447.

the injury.<sup>68</sup>

The most important limitation of the assumption of risk defense in the medical environment is that it has not been accepted as a defense to negligent injuries. The courts systematically refuse to accept "blanket consent" forms that could conceivably cover any act of negligence, and no health care provider has used a consent form that specifically includes a litany of negligent risks. While there is no theoretical reason why a patient could not consent to (and thus assume) the risk of the surgeon's leaving a clamp inside the patient, the authors believe that a court, if faced with this situation, would rule that this type of consent would be against public policy.<sup>69</sup>

Prosser's formulation for assumption of risk requires both prior knowledge and prior consent.<sup>70</sup> Acceptance of risk does not depend on this type of explicit agreement, but arises from the entire context of the health care provider/patient relationship, both before and after injury. While this unstructured relationship provides a greater opportunity for mitigation of the damages, it also increases the chance that a pipeline may be created by a major shift in the public perception of the provider's competence. A medical risk manager therefore must identify and monitor those factors that condition the patient's acceptance of the risks of medical treatment.<sup>71</sup> There are three main sources of information on those factors: the first is a retrospective evaluation of the treatment history<sup>72</sup> of patients that have sued the facility in the past; the second is an analysis of reported malpractice cases and plaintiff's law literature to determine which factors condition the patient's attorney's decision to file a lawsuit;<sup>73</sup> and the third is a patient-attitude sur-

---

68. *Id.*

69. *Id.* at 444.

70. *Id.* at 447.

71. For a discussion of the use of artificial intelligence techniques to analyze medical decisions, see Duda & Gasching, *Knowledge Based Expert Systems Come of Age*, 6 BYTE 238 (Sept. 1981).

72. This information would be obtained by reviewing the medical records of all the patients that sued the hospital in the past. It must be emphasized that this will only produce anecdotal data, unless a carefully matched control population of patients that did not sue the hospital is also studied.

73. The importance of this type of review is illustrated by the tremendous attention addressed to informed consent in the hospital literature, while at the same time an informal survey shows that it is already being discounted as a cause of action by the plaintiff's bar. For an excellent discussion of this problem, see Katz, *Informed Consent—A Fairy Tale? Law's Vision*, 39 U. PITT. L. REV. 137, 170 (1977).

vey to determine what factors the patients of the facility consider important.<sup>74</sup>

Once the risk manager has used these sources to develop a list of the relevant conditioning factors, a monitoring system must be developed to track those factors.<sup>75</sup> This monitoring system must meet three criteria: (1) It must *flag* outlier events rather than obscure them. This means that all unusual events must be promptly brought to the attention of someone with the authority to intervene if it is necessary. A prompt intervention can both mitigate the damages (persuading a patient not to leave the hospital, for example) and reduce the chance of being sued by improving patient satisfaction. (2) It must produce meaningful trend analyses rather than frequency reports. These analyses must not only provide information about the number of incidents, but must also provide information on whether there is a deviation from the expected number or type of incidents. For example, a ten-percent increase in deaths is not as useful as a report showing that the increase occurred on one day on one floor. (3) It must not create new risks that increase the facility's liability. The most common type of new risk is the documentation of incompetent staff members without disciplining them. Meeting these criteria requires the design of a reporting system to collect the necessary data. This reporting system will draw on traditional sources of risk management data such as incident reports, but it also must draw upon other data sources such as nursing committee reports, tissue committee reports, and the reports of any other oversight committees the facility has in place.<sup>76</sup>

The compilation of this multisource data demands that standard forms be developed to facilitate the transfer of information from the committees to a central data base. This data base can be as simple as a set of cross-referenced index cards, but in all but the smallest facilities it will require the use of a computer to file elec-

---

74. This is actually classic market research, with health care as the product. The main problem with this type of research is that the patients are often afraid to criticize the health care provider, making the expertise of the survey team especially important. See Ware, *Effects of Acquiescent Response Set on Patient Satisfaction Ratings*, 16 MED. CARE 327 (1978).

75. For a discussion of the potential legal risks in computerizing medical data, see Brannigan & Dayhoff, *Liability for Personal Injuries Caused by Defective Medical Computer Programs*, 7 AM. J. LAW & MED., Summer 1981, at 123.

76. JOINT COMMISSION ON ACCREDITATION OF HOSPITALS, ACCREDITATION MANUAL FOR HOSPITALS (1982).

tronically the data and perform the necessary analyses.<sup>77</sup> The development of an effective computer data base management system requires careful attention to the potential legal consequences of uncontrolled access to the data. Once data is put in a machine-retrievable form,<sup>78</sup> it is as readily available to potential litigants as it is to the facility's risk manager. This can be especially harmful if the data demonstrates the presence of prevented or normally prevented risks that the risk manager is unable to manage successfully. While this does not mean that secrecy is always the best policy (it is usually the worst policy when a patient requests his or her own records<sup>79</sup>), it is important that the risk manager be able to control the extent and timing of access to the general data base. This control requires both physical and legal safeguards.

The physical protection of data is straightforward. The computer should be of a limited-access type, preferably a dedicated machine, and there should be no other users on the system when the risk data base is on the system. If the facility does not have a dedicated computer for risk management, then it should make provisions for storing the risk management data outside of the computer when the data is not in use. The implementation of legal safeguards is not so straightforward.

The recent decision in *Upjohn Co. v. United States*<sup>80</sup> set forth general guidelines for establishing the attorney work-product privilege against court ordered discovery. While the details of the decision are beyond the scope of this article,<sup>81</sup> three important points must be considered when designing a risk management data base: (1) both the attorney-client privilege and the work-product rule

---

77. For a discussion of the mathematical techniques that could be used to process this data, see E. CARMINE & R. ZELLER, *RELIABILITY AND VALIDITY ASSESSMENT* (1979); F. HARTWIG & B. DEARING, *EXPLORATORY DATA ANALYSIS* (1979); HENKEL, *TESTS OF SIGNIFICANCE* (1976); M. LEWIS-BECK, *APPLIED REGRESSION* (1980); S. NAGEL & M. NEEF, *OPERATION'S RESEARCH METHODS: AS APPLIED TO POLITICAL SCIENCE AND THE LEGAL PROCESS* (1976); C. OSTROM, *TIME SERIES ANALYSIS: REGRESSION TECHNIQUES* (1978).

78. For a discussion of the organization of complex data bases, see Neely & Steward, *Fundamentals of Relational Data Organization*, *BYTE*, Nov. 1981 at 48.

79. E. RICHARDS & K. RATHBUN, *PATIENT'S RIGHTS HANDBOOK* 6 (1980); Richards, *Patient's Rights Issues in Medical Risk Management*, *MATERIALS FOR THE FIRST ANNUAL TEXAS HEALTH LAW INSTITUTE* (1981); Richards & Rathbun, *The Law of Patient's Rights in Texas*, 44 *TEX. B.J.* 1059 (1981); Shenkin & Warner, *Giving the Patient His Medical Record: A Proposal to Improve the System*, 289 *N. ENG. J. MED.* 688 (1973).

80. *Upjohn Co. v. United States*, 449 U.S. 383 (1981).

81. For a good review of the implications of this case see Stern, *Attorney Client Privilege: Supreme Court Repudiates Control Group Test*, 67 *A.B.A.J.* 1143 (1981).

are not absolute protections, but may be defeated in certain circumstances;<sup>82</sup> (2) information that is collected in anticipation of litigation may be protected, even if it is not collected under the direct supervision of an attorney;<sup>83</sup> and (3) previously unprotected information may not be sheltered by giving it to an attorney.<sup>84</sup> A facility that is planning a risk management program must decide to what extent it needs to protect its data from discovery before it begins data collection. If it decides that it needs the maximum protection from discovery that is available, then it must incorporate an attorney into the risk management scheme. This can be an outside counsel who supervises the data collection and also performs the necessary computer analysis of the raw data, or it may be an in-house counsel, if the in-house counsel is truly an independent counsel. If it can be shown that this in-house counsel actually acts in an administrative capacity, then the work-product doctrine may not be applicable.

### VIII. CONCLUSIONS

The rapidly escalating cost of litigation has made it imperative that corporations develop alternatives to the traditional legal mechanisms for dispute resolution. Risk management programs are an effective means of avoiding disputes and can be very cost effective if properly designed. While it is simple to design a program that will deal with obvious, costly risks, the optimal development of a program to deal with risks whose cost of occurrence nearly equals their cost of management requires sophisticated analysis techniques. The application of these techniques demands that a uniform method of data handling be developed and that the systematic identification and monitoring of conditional factors be carried out. The authors have tried to present an analytical framework to allow risk managers in diverse environments to share information and contribute to a general model of risk management interventions.

---

82. *Id.* at 1145.

83. *Id.*

84. *Id.*